Claims

What is claimed is:

1. A lead comprising:

a second lead finish including about 80%-98% by weight of lead, about 0%-4% by weight of silver, and tin attached after a first lead finish including tin is removed.

2. The lead of claim 1, wherein the second lead finish includes about 85%-98% by weight of lead, about 0%-4% by weight of silver, and a balance of tin.

3. The lead of claim 1, wherein the second lead finish includes about 82%-84% by weight of lead, about 1%-3% by weight of silver, about 9%-11% by weight of antimony, and a balance of tin.

4. The lead of claim 1, wherein the lead is to be coupled to a lead of a surface mount component.

5. The lead of claim 1, wherein the lead is coupled to a downhole electronic assembly.

6. A package structure comprising:

a package; and

a plurality of leads coupled to a circuit included in the package and having a second lead finish including about 82%-84% by weight of lead, about 1%-3% by weight of silver, about 9%-11% by weight of antimony, and a balance of tin attached after a first lead finish including tin is removed.

7. The package structure of claim 6, wherein the circuit is included in a substrate.

8. The package structure of claim 7, wherein the package structure is part of a downhole electronic assembly.

9. A circuit board, comprising:

a processor; and

a circuit coupled to the processor and included in a package structure having a plurality leads having a second lead finish including about 85%-98% by weight of lead, about 0%-4% by weight of silver, and a balance of tin attached after a first lead finish including tin is removed.

10. The circuit board of claim 9, wherein the circuit includes a memory.

11. The circuit board of claim 9, wherein the circuit includes a digital-to-analog converter.

12. A system comprising:

a lead having a second lead finish including about 80%-98% by weight of lead, about 0%-4% by weight of silver, and tin attached after a first lead finish including tin is removed; and

a downhole transducer coupled to the lead.

13. The system of claim 12, wherein the second lead finish is selected from a first composition including about 85%-98% by weight of lead, about 0%-4% by weight of silver, and a balance of tin, and a second composition including about 82%-84% by weight of lead, about 1%-3% by weight of silver, about 9%-11% by weight of antimony, and a balance of tin.

14. The system of claim 12, wherein the downhole transducer is selected from one of a downhole temperature indicator, a downhole vibration sensor, a pressure sensor, an accelerometer, and a fluxgate.

15. The system of claim 12, wherein the downhole transducer is to measure a subsurface characteristic that is selected from a group consisting of a downhole

temperature, a downhole pressure, a resistivity of a subsurface formation, a porosity of a subsurface formation, a diameter of a borehole, and a shape of the borehole.

16. The system of claim 12, further comprising:
a processor coupled to the lead.

17. The system of claim 12, further comprising:
an amplifier coupled to the lead.

18. A method comprising:
attaching a composition that includes about 80%-98% by weight of lead, about 0%-4% by weight of silver, and tin as a second lead finish to a surface of a component lead.

19. The method of claim 18, further comprising:
removing a first lead finish from the surface prior to attaching the composition.

20. The method of claim 19, wherein removing the first lead finish further comprises:
removing the first lead finish using a chemical process.

21. The method of claim 19, wherein removing the first lead finish further comprises:
removing the first lead finish using a mechanical process.

22. The method of claim 19, wherein the first lead finish includes tin.

23. The method of claim 18, further comprising:
attaching the component lead to an electronic component.

24. The method of claim 18, wherein attaching the composition further comprises:

attaching the composition using a plating process.

25. The method of claim 18, wherein attaching the composition further comprises:

attaching the composition using a coating process.

26. A method comprising:

removing a first lead finish from a surface of a lead; and

attaching a composition that includes nickel and a noble metal as a second lead finish to the surface.

27. The method of claim 26, wherein removing the first lead finish further comprises using a process selected from a chemical process and a mechanical process.

28. The method of claim 26, wherein attaching the composition further comprises using at least one process selected from an electrolysis process and an immersion process.

29. The method of claim 26, wherein attaching the composition further comprises attaching a lead-free solder to the surface.

30. An electronic lead comprising:

a second electronic lead finish comprising a composition without lead, after a first electronic lead finish is removed.

31. The electronic lead of claim 30, wherein the composition without lead comprises about 61%-69% by weight of tin, about 23%-28% by weight of silver, and about 8%-11% by weight of antimony.

32. The electronic lead of claim 30, wherein the second electronic lead finish is coupled to a downhole transducer.

33. An assembly comprising:

a downhole transducer having a component lead; and

a composition attached to the component lead, the composition including about 61%-69% by weight of tin, about 23%-28% by weight of silver; and about 8%-11% by weight of antimony.

34. The assembly of claim 33, further comprising:

a wireless transceiver capable of being communicatively coupled to the downhole transducer.

35. The assembly of claim 33, wherein the downhole transducer is selected from one of a downhole temperature indicator, a downhole vibration sensor, a pressure sensor, an accelerometer, and a fluxgate.

36. The assembly of claim 33, wherein the composition further includes at least one rare earth element selected from lanthanum, cerium, praseodymium, neodymium, promethium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium, titanium, vanadium, zirconium, chromium, and lutetium.

37. A composition comprising:

about 78%-82.9% by weight of lead, about 9%-11% by weight of antimony, about 1%-3% by weight of silver, and a balance of tin.

38. The composition of claim 37, further comprising at least one rare earth element selected from lanthanum, cerium, praseodymium, neodymium, promethium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium, titanium, vanadium, zirconium, chromium, and lutetium.

39. The composition of claim 37, having a flow temperature range of about 245° C to about 250 °C, and a solid temperature range of below about 20 °C to about 245 °C.

40. An assembly comprising:

a downhole transducer coupled to a circuit trace included in a circuit attached to a composition including about 78%-82.9% by weight of lead, about 9%-11% by weight of antimony, about 1%-3% by weight of silver, and a balance of tin.

41. The assembly of claim 40, further comprising:

a processor to be communicatively coupled to the circuit.

42. The assembly of claim 40, wherein the circuit includes a data acquisition system.

43. The assembly of claim 40, wherein the circuit includes a filter.

44. A composition comprising:

about 83%-87% by weight of lead, about 9%-11% by weight of antimony, about 1%-3% by weight of silver, and a balance of tin.

45. The composition of claim 44, further comprising at least one rare earth element selected from lanthanum, cerium, praseodymium, neodymium, promethium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium, titanium, vanadium, zirconium, chromium, and lutetium.

46. The composition of claim 44, having a flow temperature range of about 235° C to about 240 °C, and a solid temperature range of below about 20 °C to about 235 °C.